

the various fields of ethnography. . . . It is to be regretted that the capital of a nation which embraces in its domain so many and such diverse peoples should not possess a museum which shows the ethnic characteristics of some of these peoples in an adequate manner."

Mr. Dorsey has returned to his own country convinced that in the matter of the housing and exhibition of anthropological collections the United States have nothing to fear from comparison with Europe. He thinks that there is no building in Europe so admirably planned for museum purposes as the American Museum of Natural History at New York. Here ample space for future expansion has been allowed on a scale unequalled in Europe, and large, well-lighted and commodious quarters have been provided for storage and workrooms. He truly says that numerous workrooms with abundant light should be an essential feature of every museum. It is clear that in the United States the study of ethnology is being pursued with the same enthusiasm as in Germany, and that it has succeeded in a similar manner in securing a large measure of popular support. Viewed in the light of these facts, the conditions of things in Great Britain appears doubly deplorable.

NOTES.

THE complimentary dinner given to Major-General Sir John Donnelly on Tuesday, by his friends and former colleagues of the Department of Science and Art, is a testimony of the esteem in which he is held by all who have been associated with him in the work of the Department. Sir John Gorst presided, and in proposing the health of the guest of the evening, he pointed out that in 1859, when Sir John Donnelly was entrusted with the control of the science branch of the Department, the total number of science students under instruction was 395, and the payments made on account of their instruction amounted to 2000*l*. In 1897, the number of students in Departmental classes was 197,796, and the grants amounted to 169,000*l*. These figures form the best of evidence as to the growth of the work of the Department under Sir John Donnelly's administration. In addition to Sir John Gorst and Sir John Donnelly, among other speakers at the dinner were:—Captain Abney, Major-General Festing, Sir Norman Lockyer, Prof. Rücker, Sir George Gabriel Stokes, and Rear-Admiral Sir William Wharton.

DRS. STEVENS AND CHRISTOPHERS, of the Royal Society Malaria Commission, left Liverpool on December 9 for Sierra Leone, where they will continue their investigations on malaria. At Blantyre, in East Africa, where they were before, they gave more attention to investigating the relation of malaria to black-water fever, which is very prevalent at that spot. Many persons deny the connection between the two, but it is a point that still requires to be settled. On the West Coast they will probably investigate the disease from the point of view of the mosquito theory.

PROF. GEORGES LEMOINE has been elected a member of the section of chemistry of the Paris Academy of Sciences, in succession to the late Prof. Friedel.

THE following are among the lectures to be delivered at the Royal Institution before next Easter:—Mr. C. Vernon Boys, six Christmas lectures (specially adapted for young people) on fluids in motion and at rest, experimentally illustrated; Prof. E. Ray Lankester, twelve lectures on the structure and classification of fishes; Dr. W. H. Rivers, three lectures on the senses of primitive man; Prof. H. H. Turner, three lectures on modern astronomy; Dr. Charles Waldstein, three lectures on recent excavations at Argive Heræum (in Greece); Lord Rayleigh, six lectures on polarised light. The Friday evening meetings will begin on January 19, when a discourse will be

given by Lord Rayleigh, on flight; succeeding discourses will probably be given by the Hon. C. A. Parsons, Prof. J. Reynolds Green, Mr. H. Warington Smyth, Prof. J. H. Poynting, Major Ronald Ross, Prof. Frank Clowes, Sir Benjamin Stone, M.P., Prof. J. Arthur Thomson, Sir A. Noble, Prof. Dewar, and other gentlemen.

AN agricultural conference for the West Indies will be held at Barbados on January 6 and 8, 1900. His Excellency, Sir James Hay, K.C.M.G., the Governor of Barbados, has promised to meet the representatives at Bridgetown on Saturday morning, January 6, and offer them a welcome to the island. Immediately after, the President (Dr. D. Morris, C.M.G.) will deliver the opening address, and the business of the conference will begin. A characteristic of the conference will be the presence of representatives of the leading agricultural societies in the West Indies. By this means it is anticipated that the conference will act as an educative agent of great value, and by enlisting the co-operation of those practically engaged in agriculture, its deliberations will have wider scope, and the influence of the conference will be more widely recognised. The list of subjects to be dealt with covers practically every branch of West Indian agriculture.

ORNITHOLOGY has suffered a severe loss by the death of Arthur Cowell Stark, M.B., who was killed by a Boer shell at Ladysmith on November 18. Dr. Stark was an ardent naturalist, and specially conversant with South African ornithology, having devoted many years to the study of the birds of the Cape Colony and adjoining countries. At the time of his death he had just completed for the Press the first volume of a work on South African birds, which is to form a portion of Mr. W. L. Sclater's "Fauna of South Africa." Dr. Stark was in England during the past summer engaged in the preparation of his book, but returned to the Cape in September last, and proceeded to Natal in order to continue his collections in that colony. When war broke out he offered his services as a volunteer on the Medical Staff, and was sent up to Ladysmith by the last train that passed the Boer army. Standing at the door of the Royal Hotel in Ladysmith, on November 18, he was struck by an exploded shell, and died shortly afterwards. Dr. Stark was a graduate of the University of Edinburgh, and a well-known member of the British Ornithologists' Union.

A CONGRÈS international des sciences ethnographiques will be held in connection with the Paris Exposition, on August 26–September 1, 1900. There will be seven sections, dealing respectively with general ethnology, sociology, and ethics; ethnographical psychology; religious sciences; linguistics and palæography; sciences, arts, and industries; descriptive ethnography. The treasurer of the organising committee is M. Leclère, rue Lecourbe, 54, Paris, and the general secretary, M. Greverath, rue d'Athènes 3 bis, to which address foreign correspondence should be sent.

THE essay on the scientific work of Lord Kelvin, contributed by Prof. G. F. Fitzgerald to an elegant volume just published by Messrs. James MacLehose and Sons, Glasgow, is a masterpiece of appreciative writing. The volume contains a complete account of the celebrations on the occasion of Lord Kelvin's jubilee as professor of natural philosophy in the University of Glasgow; it is thus of particular interest to the many friends who took part in the ceremonies, and to the scientific bodies who sent delegates and messages of congratulation. Preceding this report is Prof. Fitzgerald's essay, in which the nature and significance of Lord Kelvin's contributions to science are described with such remarkable lucidity that every one interested in the progress of natural knowledge would do well to read it. A striking photogravure of Lord Kelvin, from a portrait taken in 1898, forms the frontispiece, and a portrait is given

engraved from a photograph taken in 1846. The volume will doubtless be treasured by Lord Kelvin's many admirers, as a slight tribute of regard for the versatility of his genius.

THE *British Medical Journal* announces that Dr. Yersin, whose name is well known for his researches on the plague, has been charged by the Government of Cochin China with a special mission to Java.

IT is reported in *Science* that the Russian Astronomical Society has finally given up its attempt to revise the Julian calendar. The reason assigned for its failure by the Society is "the impossibility of establishing an agreement between the dates of the religious festivals appearing in both calendars."

IN connection with the Institution of Electrical Engineers, a number of local centres are being established where papers will be read and discussed at the same time, or shortly after, their reading in London. In Cape Town these informal meetings have been held for some time past, and advance copies of the Institution's papers have been read at them. A meeting for the formation of a north-eastern centre was to be held yesterday at the Durham College of Science, and the Council have received a petition for the establishment of a similar organisation in Dublin.

WE regret to see the announcement of the death of Mr. N. E. Green, F.R.A.S. An artist by profession, Mr. Green was well known for his admirable astronomical drawings—especially those of Jupiter and Mars. On the occasion of the opposition of the latter planet in 1877 he went to Madeira, where he made a fine series of drawings, a selection from which was published in vol. xlv of the *Memoirs* of the Royal Astronomical Society. A number of his drawings of Jupiter were reproduced in vol. xlix. of the same publication, and he left behind him a long series of unpublished lunar and planetary drawings. Mr. Green was President of the British Astronomical Association in 1897-98.

THE Institution of Electrical Engineers held their annual dinner on Wednesday, December 6, in the Hotel Cecil, Prof. Silvanus Thompson in the chair. Among the speakers was Lord Kelvin who proposed the toast of "Science." In the course of his remarks, he said:—"When the electric telegraph came into practical existence in 1837, when ten years or so later the first submarine cables connected England and the Continent of Europe, and when another ten years or so saw the first Atlantic cable laid, electrical science in all the Universities of Europe was in a very backward state compared with the position in which it is now. A very great stimulus indeed was given to its study from its application to electric telegraphs, and especially to the great system of electric measurements which is so valuable now in pure science—a system which originated certainly not among practical engineers, but among University professors. Gauss and Weber gave from Germany the foundation of the system of electric measurements, the benefits of which are now enjoyed, and the first practical use of which was made in connection with submarine cables.

A PAPER on the manufacture of artificial silk or lustrous-cellulose was read by Mr. Joseph Cash at a meeting of the Society of Arts on December 6, and is printed in the *Journal* of the Society. A public company for the manufacture of this material by the Chardonnet process has been formed in England, and the factory will be capable when filled with machinery of producing 7000 lbs. of artificial silk per week. The first stage of manufacture is the nitration of cotton or wood pulp producing pyroxyline, discovered by Pelouze in 1838. The greatest care must be employed in conducting this operation, as it is the most important one in the whole process; mistakes sometimes even

occur at the long-established factory at Besançon, in France. The process of nitration of cellulose is the displacement of a few molecules of hydrogen by nitric peroxide. There are several varieties of pyroxyline which are obtained by using different mixtures of acid. When the pyroxyline has been obtained, it is placed in a cylinder with a mixture of alcohol and ether; the cylinder is then slowly revolved for twelve hours, with the result that the pyroxyline is dissolved and collodion is produced. After filtration by forcing it through a sheet of cotton-wool between calico, under a pressure of fifteen atmospheres, the collodion is ready for use.

FOR the manufacture of artificial silk a pressure of forty to forty-five atmospheres is required to force the collodion from the reservoirs to the spinning machines, which are constructed with pipes running on each side. Into these pipes are screwed a number of taps with a glass capillary tube fixed on the end, called a silk-worm, through which the collodion is forced; immediately it comes into contact with the air it solidifies, enabling the operative to take hold of the thread or silk, as it can now be called, and convey it to the bobbin. From twelve to twenty-four of these threads are run together on to one bobbin, according to the size of silk required, as is the case with natural silk. After the silk has been dried it is very inflammable and quite unfit for use in textile goods; therefore, a process called denitration is next carried out, which reconverts the product into cellulose. One of the uses of the material is for mantles for the incandescent gas light, it being found that the salts of the rare metals can be mixed with the collodion with greater economy than with any other thread. Large works are in operation at Besançon, in France, producing 7000 lbs. weight per week; but the demand is so great that extensions of the works are being made in order to enable them next January to produce 2000 lbs. per day. The production at Sprietenbach is 600 lbs. daily. Other factories are about to be established in Belgium and Germany.

MENTION is made in *Science Abstracts* of a method of thawing water service pipes by means of electricity, successfully used in Canada. The frozen pipes are thawed by passing alternating currents through them. A pressure of twenty to fifty volts is used, obtained from a portable transformer connected with the street mains. A current of 200 to 300 amperes is passed through the frozen pipe until the water flows freely, which usually takes place in a few minutes.

IN 1894, Prof. van der Waals found a remarkable property of the molecular potential function occurring in his theory of capillarity, namely, that if a constant coefficient be left out of account the potential of a homogeneous sphere at an external point is the same function of the distance from the centre of the sphere as if the whole mass were concentrated at the centre. Dr. G. Bakker, writing in the *Proceedings* of the Royal Academy of Sciences of Amsterdam, now investigates the most general form of potential function possessing this property, and he obtains for the potential at distance r the form

$$\phi(r) = \frac{Ae^{-qr} + Be^{qr}}{r} + C.$$

For the potential function required in the theory of capillarity Dr. Bakker remarks that $B=0$. The author further investigates whether it is possible to obtain a potential differing in form from the Newtonian potential and satisfying the further condition that the potential is constant throughout the interior of a spherical shell. It is found that a solution exists, but as the expression for the potential function involves the radius of the shell, the result is in no way contradictory to Laplace's conclusion that the Newtonian potential is the only potential which is constant throughout the interior of a spherical shell, *irrespective of the size of its radius*.

WE have recently received the annual report for 1898-99 of the Bacteriologist of the Government of India. The report deals chiefly with experiments on Rinderpest carried on in the laboratory at Muktesar, a preliminary note of which appears. The methods of protective inoculation that are used in South Africa are not convenient for a country like India; Koch's method of using bile from an animal just killed, requiring the slaughter of many animals, is contrary to the religious susceptibilities of the people. The disease, which has been in India for centuries, seems to be of an endemic character, and not liable to spread with the same alarming rapidity as it does in South Africa, so it does not seem all-important to produce a very lasting immunity to check the disease in any particular locality. Since the disease will probably have been going on for some time in a place before measures can be adopted, a rapidly immunising agent is desirable. The serum method seemed to be the most fitted to the purpose, and it is this that is being tried. It is a great loss that the laboratory at Muktesar, the only Government laboratory anything like properly equipped, has recently been burnt down, but we trust no time will be lost in rebuilding it; India at the present time can ill-afford to do without laboratories.

WHETHER ants can hear is a question which has for some time been engaging the attention of Mr. Weld, of the Iowa University, who has published an account of some of his experiments, and the conclusions he draws from the same, in *Science* of November 24. He states that for many years it has been the accepted opinion amongst naturalists that these insects are not endowed with an acoustic sense, at least within the range of sounds perceptible to the human ear. This opinion is based upon the failure of experiments to show that even the loudest and shrillest noises produce the slightest effects on ants subjected to their influence. This, however, is not the result of Mr. Weld's experiments upon several American species of these insects. In one case an ant confined in a test-tube was brought near a milled disc rotating in the air. At each sound from this apparatus the ant showed unmistakable signs of agitation, quickly moving its head and antennæ. Again, when shrill sounds were produced close to a colony protected under glass, the ants instantly showed by their rapid movements signs of excitement and alarm. This leads the experimenter to conclude that at least some (and possibly only American) species of ants are capable of perceiving vibrations, conducted through the air or other media, which are audible as sound to the human ear. He is, however, careful to add that this does not necessarily demonstrate that they hear in the strict sense of the word, but merely that they are capable of perceiving ordinary sound vibrations.

IN the course of an article on the late Mr. P. H. Gosse, published in the March number of the *Journal of the Jamaica Institute*, Mr. Duerden has some interesting observations on recent changes in the fauna of that island. He first of all states that in spite of its being less abundant around country residences, the Indian mungoose appears to be as common as ever in the island, over 1400 head having been trapped on two estates in eight weeks. His next subject is ticks, which have become a terrible plague in certain districts. Although they always existed, originally there appears to have been but one species in the island, but many others have been introduced on foreign cattle and sheep. A few years ago a virulent disease broke out in the cattle, which was at first diagnosed as being allied to the well-known "Texas fever." Subsequently the characteristic symptoms of that disease were found to be absent, as were the well-known parasitic organisms by which it is accompanied; but there still seems no doubt that the bovine

epidemic is in some way connected with the presence of myriads of introduced ticks.

IN a second communication to the same journal, Mr. Duerden gives the results of the attempts to improve the sea-fisheries of Jamaica. Unfortunately these attempts have not met with the success that was hoped for. The two chief reasons for the failure—and they are amply sufficient—are, firstly, the amount of coral on the sea-bottom, which renders trawling impracticable; and, secondly, a general scarcity of fish, especially those of the valuable flat-fish group (*Pleuronectidae*). On one place where trawling is practicable, it was considered a remarkable feat that a dozen small soles were taken in a day. There are no shoals of fish corresponding to those of the herring, mackerel, and cod of other seas; so that the whole outlook is gloomy in the extreme.

THE *American Naturalist* for November contains the fifth instalment of Messrs. Cowstock and Needham's important contributions to the study of the structure of the wings of insects, for the details of which we must refer our readers to the memoir itself.

MESSRS. FRIEDLÄNDER AND SON, Berlin, have just issued a catalogue (No. 439) containing classified lists of books and papers on crystallography.

MESSRS. DAWBARN AND WARD have published the third edition of Dr. P. H. Emerson's "Naturalistic Photography." The first part is concerned with the æsthetic side of photography, but in the second part technique and practice are treated, and from it both amateur and professional photographers may derive sound philosophy and serviceable hints.

IN the part just received (1899, 1^{te} Hälfte) of the *Sitzungsberichte* of the Niederrheinische Gesellschaft für Natur und Heilkunde zu Bonn, the most important papers are by Dr. Max Koernicke on the spiral thickening bands in the conducting tubes of plants; and by Prof. W. Voigt on artificial regeneration in Planaria.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus rhesus*, ♀) from India, presented by Mr. F. G. Stenning; a Lesser White-nosed Monkey (*Cercopithecus petaurista*) from West Africa, presented by Mr. R. Caton Woodville; two Hobbys (*Falco subbuteo*), captured in the Indian Ocean, presented by Mr. J. H. Ingram; a Fieldfare (*Turdus pilaris*), British, presented by Mr. Herbert Goodchild; a Delaland's Gecko (*Tarentola delalandii*) from Teneriffe, presented by Mr. J. Chappell; a Mozambique Monkey (*Cercopithecus pygerythrus*) from East Africa, a Bee-eater (*Merops apiaster*), a Partridge (*Perdix cinerea*), European; two Brown's Parrakeets (*Platycercus browni*) from North Australia, a ——— Tortoise (*Testudo nigrila*) from the Galapagos Islands, three Blanding's Terrapins (*Emys blandingi*) from North America, deposited; a Yellow-footed Squirrel (*Sciurus ludovicianus*) from Texas, a Tufted Duck (*Fuligula cristata*), European; two Common Scoters (*Ædemia nigra*), British, purchased.

OUR ASTRONOMICAL COLUMN.

ORBIT OF FIFTH SATELLITE OF JUPITER.—Prof. E. E. Barnard has had the fifth satellite of Jupiter under close observation for some considerable time during the oppositions of 1898 and 1899. Although the increasing southerly declination and the bad season in which the oppositions now occur make the satellite a difficult object, good measures have been secured on several dates. Tisserand having drawn attention to the fact that the measures previously given provided evidence of the eccentricity of the satellite's orbit (*Comptes rendus*, vol. cxix.,